

METHOD FOR ENHANCING VERTICAL GROWTH DURING THE SELECTIVE
FORMATION OF SILICON, AND STRUCTURES FORMED USING SAME

ABSTRACT OF THE DISCLOSURE

A method of selectively forming contact regions on a substrate having a plurality of exposed regions includes selectively forming a contact region on each of the exposed regions of the substrate. During formation, each contact region has a first growth rate in a first direction and a second growth rate in a second direction. While each contact region is being selectively formed on the respective exposed region, the contact region is heated to increase the first growth rate of the contact region in the first direction relative to the second growth rate of the contact region in the second direction. The first growth rate may be a vertical growth rate and the second growth rate may be a lateral growth rate. The contact may be heated by applying electromagnetic radiation to an upper surface of the substrate and not applying the radiation to the vertical portions of the contact region to thereby increase the vertical growth rate relative to the lateral growth rate. The electromagnetic radiation may be collimated light such as that generated by a scanning laser beam, and the substrate and formed contact regions may be silicon or other suitable materials. This method may be used during the fabrication of MOS transistors in memory devices and other integrated circuits.